Clean Water State Revolving Fund FY16 Green Project Reserve

- Preliminary GPR –

City of Hagerman Wastewater Facility Project

SRF Loan #WW 1603 (pop. 872)

$5,088,905

Preliminary Green Project Reserve Justification

Business Case GPR Documentation

1. TREATED EFFLUENT LAND APPLICATION SYSTEM CONSTRUCTION (Water Efficiency). Business Case GPR per Section 4.5-8: *Land application in which feasible alternatives exist* ($2,200,000).

2. UPGRADE LIFT STATIONS WITH NEW CENTRIFUGAL PUMPS WITH PREMIUM ENERGY-EFFICIENT MOTORS (Energy Efficiency). Business Case per GPR 3.2-2: *projects that achieve a 20% reduction in energy consumption*; *if a project achieves less than a 20% reduction in energy efficiency, then it may be justified using a business case* ($250,000).

Prepared by the State of Idaho SRF Loan Program
July 2016

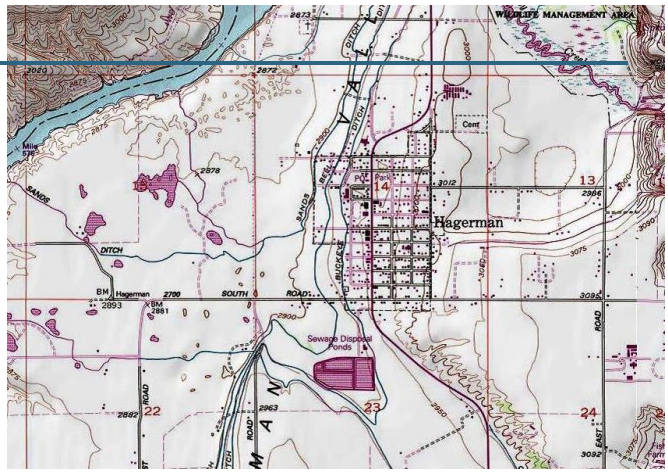
1. LAND APPLICATION SYSTEM (LAS)

Summary

- The City of Hagerman is upgrading wastewater facilities which include rehabilitation of an existing lagoon, construction of an additional lagoon, lift station upgrades, installation of additional mains, and purchase of 100-acres of land for a new effluent reuse system. The reuse system will enable the City to retire an existing surface water discharge.
- Loan amount = $5,088,905;
- GPR Costs = Land purchase + mechanical = $2,100,000
- Green portion of loan = 41%

Background[1]

- The City of Hagerman wastewater upgrade includes rehabilitation of an existing lagoon, construction of an additional lagoon, lift station upgrades, installation of additional mains, and purchase of 100-acres of land for a new effluent reuse system.
- The reuse system will enable the City to retire approximately 9,300 feet of 8-inch PVC outfall piping to the Snake River.



LAS GPR Justification

- From an overall cost perspective, the less expensive wastewater disposal alternatives evaluated were: (i) lagoons with discharge to rapid infiltration basins, and (ii) lagoon treatment with discharge to evaporative lagoons.
- Considering all costs, the preferred lagoon treatment with winter storage and beneficial reuse option, is more expensive than the other two alternatives.

LAS Benefits

- The benefits of the reuse option include: discharge of nitrogen and phosphorus will be eliminated to a watershed identified as water-quality impaired for nutrients.
- The land application and reuse system will also eliminate compliance problems currently experienced with the City's NPDES discharge permit.

Conclusion

- The treated effluent slow-rate land application and reuse system was chosen over other less expensive alternatives.
- **GPR Costs Identified:** Effluent Reuse System (including land purchase + earthwork, pumps, piping, etc.) = $2,100,000
- **GPR Justification**: Categorical Justification (Water Efficiency) per Section 2.2-6: *Recycling and water reuse projects that replace potable sources with non-potable sources, and* 2.2-6b: *Extra treatment costs and distribution pipes associated with water reuse*; and Business Case (Water Efficiency) per Section 4.5-8: *land application in which there is a cost-effective alternative.*

[1] City of Hagerman Wastewater Facilities Plan, JUB Engineers, May 2016

2. New Lift Station Pumps

Summary

- Lift Stations 1 and 2, built in 1977, will be rehabilitated as part of the upgrade project, including installing new centrifugal pumps equipped with premium efficiency motors.
- Total Loan amount = $5,088,905
- Estimated energy efficient (green) portion of loan = 4.9% ($250,000) (Preliminary estimate)

Energy Efficiency Improvements[2]

The City has elected to replace Lift Stations 1 and 2 due to their severely deteriorated condition, age, and inability to meet current regulations.

GPR Justification

The Baseline Standard Practice for comparison is the existing pumps:

- **Existing Pumps - standard efficiency motor**
  Type centrifugal; Efficiency 70%; Flow 3,000 gpm; 4.3 mgd; Head 17 ft
  Motor rating = 25 hp; Motor type = standard efficiency (89.3% assumed at 75% of full load[3])
  BHP, existing avg flow = 20.6 hp; % operation = 34% (average day flow/pump output)
  Energy usage = 45,239 kW-hr
- **Proposed Pumps - premium efficiency motor**
  (93.4% assumed at 75% of full load)
  BHP, existing avg flow = 19.7 hp
  % operation = 34% (average day flow/pump output)
  Energy usage = 43,254 kW-hr

∴ There is a xx% energy reduction when compared to the existing pumps.

Conclusion

- The combined annual energy savings for utilizing premium pumps is estimated to be xxxx kWh/year per motor - corresponding to an energy reduction of xx% when compared to the Baseline Standard Practice.
- The premium energy-efficient pumps are categorically GPR eligible as they achieve greater than 20% reduction in energy consumption.
- **GRP Costs Identified**:
  Pumps (2 @ $125,000 = $250,000) = **Total = $250,000**
- **GPR Justification**: The Pumps are Categorically GPR eligible (Energy Efficiency) per Section 3.2-2[4]: *Projects that achieve a 20% reduction in energy consumption are categorically eligible for G*PR; and Business-Case GPR eligible per Section 3.2-2: *if a project achieves less than a 20% reduction in energy efficiency, then it may be justified using a business case,* and 3.4-1: *An evaluation must identify energy savings and payback…that does not exceed the useful life of the asset.*

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[2] Preliminary - Design specs will be used to calculate energy efficiencies in the GPR Technical Memorandum.
[3] http://www.copper.org/environment/sustainable-energy/electric-motors/education/motor_text.html
[4] Attachment 2. April 21, 2010 EPA Guidance for Determining Project Eligibility